

2

EXISTING CONDITIONS



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2.0 INTRODUCTION

Defining the existing conditions of the study area is a critical element of the SRTS Action Plan. It documents the current built environment of the study area, participant perceptions and the social norms within the individual school that ultimately delineate the issues the Action Plan must mitigate. The existing conditions are documented through a series of data collection processes that interface both the engineering and planning aspects of the SRTS Program. By combining the identification of infrastructure barriers and deficiencies in the non-vehicular transportation system with the identification of the regulations, policies and social patterns of the school's adjacent community, a complete profile can be assembled that fully defines the unique challenges of each individual school's community as well as the goals of its Action Plan.

A comprehensive, multi-faceted approach was taken to examine existing conditions including the collection of data from parent surveys and student travel tallies, site work and field interviews, and area mapping. A thorough inventory of existing conditions is assembled to provide a baseline by which to measure the results and outcomes of the SRTS Program at the community, school and street levels. The following resources were used to develop the baseline profiles of the existing conditions at McDougle Elementary and Carrboro Elementary:

Tallies and Student Counts collected within the classrooms identify student travel norms, a profile of the school's travel environment and the number of children using each mode of transportation.

Parent Surveys distributed by the schools identify parental perceptions of the walkability and/or bikeability of his/her child's route to school. These surveys were a key component in the identification of

relevant influences in family transportation choices to/from the school.

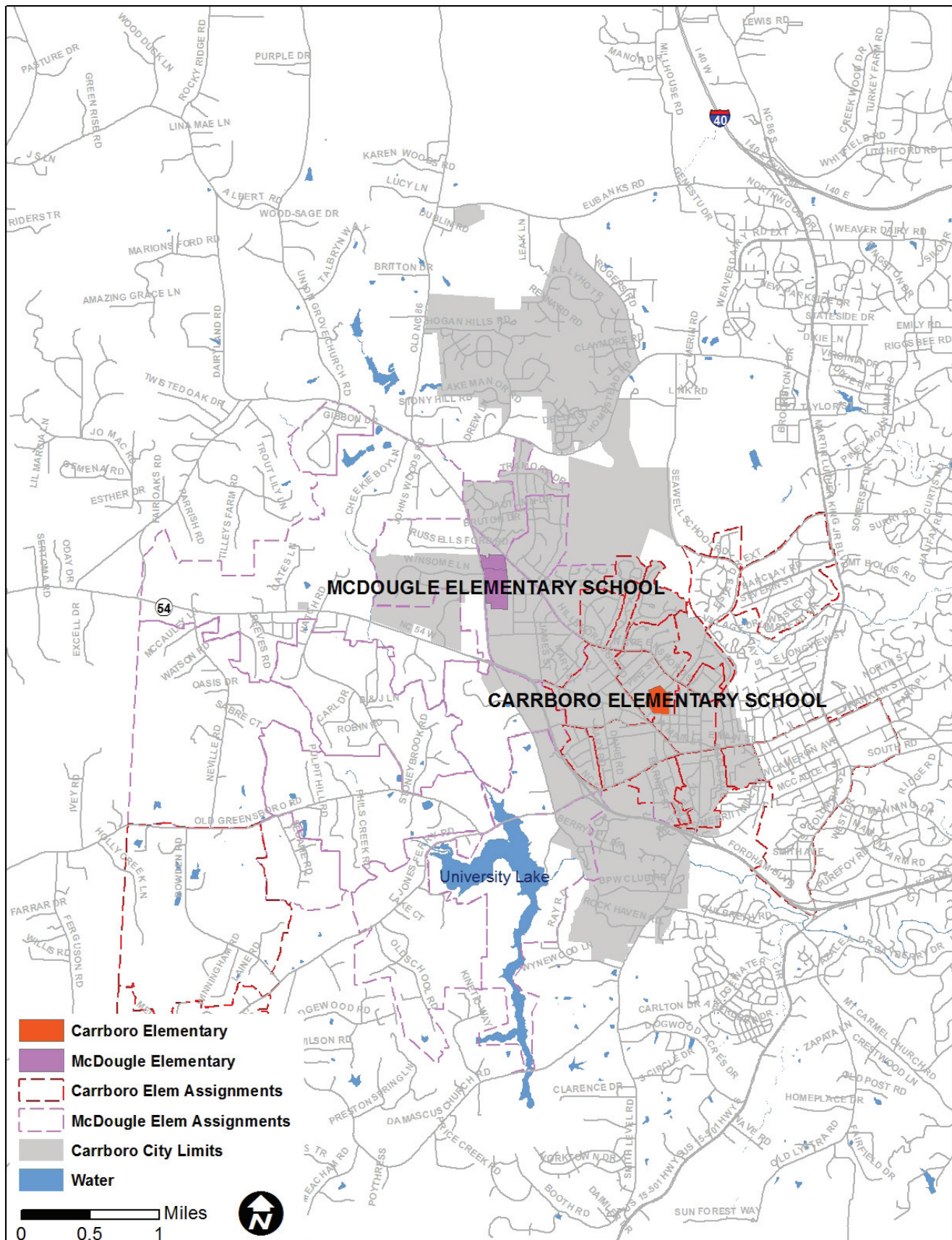
Field Assessments were used to evaluate the supporting infrastructure and user behaviors through on-site data collection and mapping of existing conditions. During their on-site assessments, the Consultants logged the important features of both the physical and behavioral components of the pedestrian environment within the school zone and spoke with crossing guards, police officers, municipal planners, teachers, administrators, and agency officials.

Existing Data Sources were tapped to expose all relevant points-of-interest to the Action Plan such as roadways and intersections with pedestrian and bicycle statistics including, but not limited to, significant crash histories as well as future State and municipal capital improvement projects that may impact the school's pedestrian routing plan. Geographic Information Systems (GIS) data was critical to analyze bicycle and pedestrian facilities and gaps.

2.1 TOWN OF CARRBORO OVERVIEW

The Town of Carrboro is a walkable and bikable community and boasts the highest bicycle mode-share in the State. Carrboro has made bicycle and pedestrian planning a priority for the last three decades yielding a compact multi-modal environment with miles of existing bicycle lanes, trails, and sidewalks. It is common for citizens of Carrboro to use bicycles as a mode of transportation for utilitarian, school, and recreational trips.

Map 2.1 School Service Boundary Map



2.2 MCDOUGLE ELEMENTARY OVERVIEW

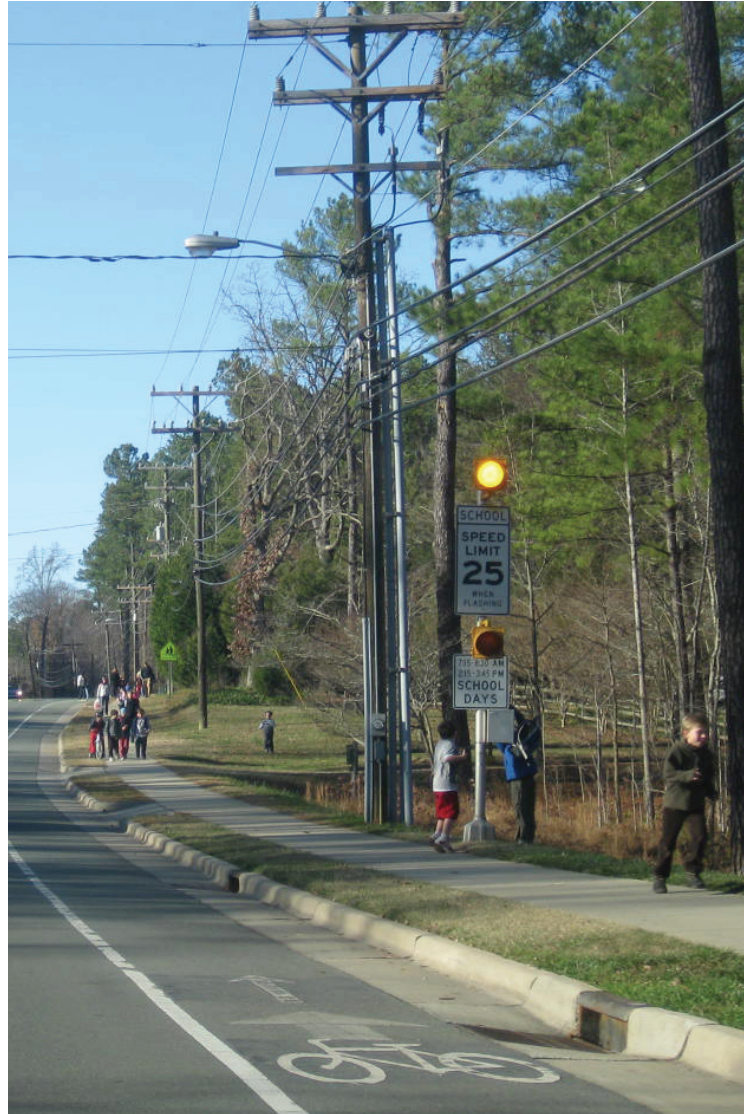
McDougle Elementary is a walkable and bikable school for a number of reasons: 1) its existing bicycle and pedestrian facilities, 2) the mindset of acceptance in Carrboro that walking and bicycling are legitimate and common forms of transportation, and 3) the desire for healthier living through exercise, community building, and lower emissions. Many Carrboro parents walk their children to school as a matter of practice no matter what the weather.

McDougle Elementary is flanked by Hillsborough Road and Old Fayetteville Road, two significant two-lane arterials through Carrboro. The school service boundary map (Map 2.1) indicates those areas of Carrboro districted for attendance at McDougle Elementary.

2.3 MCDOUGLE TALLIES AND STUDENT COUNTS

The National Center for Safe Routes to School provides a Student Arrival and Departure Tally to help measure the modes of transportation utilized by the students and how the SRTS Program will affect vehicular trip generation for the school. This tally may be taken annually and is a measure of the overall success of the program.

The following tables (Tables 2.1 and 2.2) show the results of tallies collected in Fall 2009 breaking down the non-motorized traffic by mode of transportation and by origin relative to school location.



It is commonplace to see many children walking home to school from McDougle Elementary (above on Hillsborough Road).

Table 2.1: Travel Norms for McDougle Elementary

McDougle Elementary Travel Norms	
Transportation Mode	Number of Students
Driven by Parents	299
Transported by Bus	131
Walked	80 (with permission)
Bicycled	60 (with permission)

Table 2.2: Percentage of Students Walking and Bicycling by Distance

Pedestrian and Bicycle Breakout by Locality and Transportation Mode		
Distance to School	Walk	Bicycle
Less than 1/4 mile	38%	19%
Between 1/4 and 1/2 mile	34%	5%
Greater than 1 mile	0%	0%

2.4 MCDOUGLE PARENT SURVEYS

The Parent Survey, provided by The National Center for Safe Routes to School, polls parents to determine the key factors affecting parents' decisions to allow or disallow children to walk or bicycle to their area schools. These surveys also help identify the presence of safety-related conditions and provide basic background information for demographic correlation and analysis. Both the Parent Survey and Student Tally forms should be conducted at least annually to track changes and determine the success of the SRTS program.

The following information in Tables 2.3 and 2.4 was compiled from McDougle Elementary Parent Surveys in Fall 2009 and highlights parent perceptions of their children's existing non-motorized routes to school and the improvements necessary to elicit their participation in the SRTS program.



Automobile traffic ranked high among parents' concerns for allowing their children to walk or bicycle to school. Above is the Hillsborough Road/Old Fayetteville Road intersection.

Table 2.3: Top Five Concerns for Parents Under Existing Conditions

Top Five Concerns of Parents	
1. Safety at intersections and crossings	
2. Distance	
3. Traffic speed along route to school	
4. Traffic volume along route	
5. Presence of sidewalks or pathways	

For complete results, see Appendix A.

Table 2.4: Top Five Improvements Specified as Prerequisite by Parents for Participation

Top Five Improvements	
1. Safety at intersections and crossings improved	34.4%
2. Traffic speeds along route to school	30.0%
3. Traffic volume along route	28.6%
4. Sidewalks or pathways added/improved	28.6%
5. Distance to walk/bicycle reduced	21.4%
5. Adults to walk/bicycle with	21.4%

For complete results, see Appendix A.

2.5 MCDOUGLE FIELD ASSESSMENT AND MAPS

Fieldwork included a thorough on-site assessment of existing infrastructure within the school zone, and an evaluation of both traffic and behavioral patterns exhibited by roadway users during drop-off and pick-up. The field assessment broadly analyzes school traffic patterns, characteristics of the transportation network users, and the existing infrastructure strengths and weaknesses within the school zone.

The following pages highlight the data collected pertaining to the strengths and weaknesses of the existing pedestrian environment for McDougle Elementary School. A photographic inventory, infrastructure survey and site mapping are included.

Behavioral Components of Vehicular and Pedestrian Traffic Patterns

The majority of students bicycling or walking to school do so with parental supervision. On-site observations noted high concentrations of cyclists and pedestrians emerging from the neighborhoods to the east of McDougle Elementary and Hillsborough Road. Additional information describing the travel norms for McDougle Elementary is listed below:

- Motorist behavior was observed as “good” as drivers were observed adhering to pedestrian courtesies as appropriate on campus and as “exceptional” at the Hillsborough Road crossing.
- Students and parents made use of the existing sidewalks on the east side of Hillsborough Road leading directly to the marked crosswalk and crossing guard at the school entrance.
- Automobile traffic was slow, polite, and respectful of pedestrians and designated traffic patterns. Motorists dropping children off at the Old Fayetteville Road main entrance appeared rushed to exit traffic pattern, but there were noticeably fewer pedestrians approaching this entrance.
- Cyclist and pedestrian behaviors were observed to be generally safe around the school. Parents and children bicycling or walking to school exhibited “good” behavior and followed the traffic patterns and safety rules. It was clear that these were regulars who routinely walked or bicycled to school.

- Street crossings were organized and users exhibited responsible behavior. No incidents of hazardous behavior, like darting, were observed during the site visit. Families crossed with the crossing guard. Children knew to wait for the crossing guard’s signal. Children and parents observed bicycling to school were wearing the appropriate helmets.

- The Hillsborough Road midblock crossing located at the rear entrance of the school was used by dozens of parents and students. Everyone observed the direction of the crossing guard (Mr. James). Most



Bicyclists and pedestrians obeyed traffic laws by walking in the sidewalk and bicycling in the bicycle lanes (with helmets). Above on Hillsborough Road near school entrance. Below, bicyclists wait until the crossing guard directs them (also at Hillsborough Road midblock crossing).



were observed walking; although, some families rode bicycles and some children rode scooters. This is also the entrance utilized by the school buses. The automobile traffic was courteous and respectful of pedestrian interruption in traffic flow. Having a crossing guard at this location is a critical safety consideration.



The crossing guard at McDougle Elementary helps to make walking and bicycling to school fun.

- Crime was not a significant issue of concern based on field analysis and public input.

Existing Infrastructure - Strengths

Since bicycle and pedestrian facilities have long been a focus of capital investment for Carrboro, there is an extensive facility base in the vicinity of McDougle Elementary with significant cyclist and pedestrian volumes. The existing system is quite strong and the following observations were noted as existing system strengths.

- There are a number of well maintained trails suitable for both bicycle and pedestrian traffic within the McDougle school zone.
- There is a substantial network of sidewalks within the McDougle Elementary school zone that are in relatively good condition. Numerous sections of sidewalk can be found around the school and across campus. Mapping of the existing sidewalk network is shown on Maps 2.2 and 2.3.
- Nearby intersections/crossings are equipped with pedestrian treatments ranging from marked crosswalks to countdown pedestrian signal heads.



The Horne Hollow path is an existing facility that could connect families from northeastern neighborhoods easily to McDougle Elementary.



New sidewalk along James Street provides access for pedestrians coming to McDougle Elementary from the south.

- McDougle Elementary has adequate bicycle racks available for student usage. Five bicycle racks were observed in locations dispersed across the campus. However, the racks located by the rear entrance of the school off of Hillsborough Road had the highest utilization on the day of the site visit. Observation of site traffic confirmed a predominant percentage of cyclists use this rear entrance.



Bicycle racks on the eastern entrance to campus receive heavy use, even on cold mornings.

Existing Infrastructure - Deficiencies

Despite the strengths of the existing system, there are several issues related to infrastructure that warrant improvement, create safety hazards and prevent children from walking and cycling to school. Key weaknesses, barriers, and obstacles were annotated as follows:

- There are significant gaps in sidewalk connectivity along routes joining target neighborhoods to the school's campus. Table 2.5 summarizes key locations where insufficient walkways or system breaks in sidewalk continuity create barriers to pedestrians.
- There are multiple roadways that pose safety barriers for school-age cyclists and pedestrians. Traffic is significant along the primary roadway system within the school zone most notably upon Old Fayetteville Road, Hillsborough Road, Main Street, and NC Hwy 54.
- NC Hwy 54 is a major four lane arterial with a speed limit of 45 mph. Speed limits along the other roadways are posted at 35 mph. However, site visit obser-

vations noted many instances where roadway users seemed to exceed the posted speed limit. Traffic volumes and speeds were both in the top five perceived concerns by parents in the National SRTS surveys at McDougale Elementary. SRTS team members confirmed the validity of these concerns in the field.

- Present roadway and intersection geometrics encourage higher speeds and present safety challenges for cyclists and pedestrians. Wide turning radii at intersections typically increase traffic speeds. Additionally, intersection geometrics such as wide roadway cross sections create long distances for pedestrians to traverse, increasing pedestrian hazards and reducing roadway efficiency. Key concerns are presented by intersection with more details provided in the upcoming intersection crossing section.

- Bicycle racks were predominantly located in the rear of the school with some installed and/or maintained under inconvenient conditions for users. All of the bicycle racks were uncovered.

- Some intersections had curb ramps in ADA non-compliance sighting incomplete curb ramps at intersection radii, incorrect positioning within the radii and the lack of truncated domes.

- Horne-Hollow path and Quail Roost path lacked lighting.

- Existing pedestrian facilities require regular maintenance. On-site observations took note of general maintenance issues along bicycle lanes as well as the pedestrian path connecting Quail Roost Drive to the McDougale campus. Bicycle lanes require regular sweeping to avoid possible injuries. Bicycle lanes along the adjacent roadways were littered with hazardous debris to cyclists. The path connecting Quail Roost to McDougale Elementary was in need of repair.

Table 2.5: Insufficient Walkways

Key Sidewalk Gaps		
Roadway	Orientation	Gap Description
Hillsborough Rd.	West side	From Old Fayetteville Rd. to Greensboro St.
Old Fayetteville Rd.	East side	From McDougale Elementary to NC 54
Horne Hollow Path	Southern leg	From Existing trail (Autumn Dr.) to Hillsborough Rd.
NC 54/Main St.	North side	From High St. to Old Fayetteville Rd.



Private maintenance workers blow leaves into bicycle lane on Hillsborough Road.

Key Crossings

Hillsborough Road / James Street / Quail Roost Drive

These three roads come together at one location without the presence of a traffic signal. However, there is a flashing light posted with a warning sign alerting traffic to the school pedestrian crossing ahead and the applicable hours on the southbound Hillsborough Road approach.

Other infrastructure features of concern in this vicinity included the use of standard pavement markings for the Hillsborough Road crosswalk rather than high visibility pavement marking alternatives. The marked crosswalk over Hillsborough Road is inadequate because it is not highly-visible. Additionally, the cross-



Intersection of Hillsborough/James/Quail Roost.

walk traversing James Street west of Hillsborough Road is very wide and has exceptionally wide curb radii due to the skew of the intersection. Again, both of these geometric features contribute to hazardous conditions for pedestrians and contribute to roadway inefficiency.

There is a marked sight distance hazard at the intersection of Hillsborough Road and James Street due to a curve northwest of the intersection. SRTS team members counted significant pedestrian traffic at this intersection, attributed to a path used as a short cut by students on Quail Roost Drive to the school grounds. Despite having a crossing guard in the past, there is not one currently.

Old Fayetteville Road at Main School Entrance

A police officer directs the ingress and egress of vehicular traffic at the main entrance. No students were observed walking across Old Fayetteville Road. With left and right turning lanes, it would be difficult to make significant crossing improvement under SRTS project budgets. However, there are alternatives for consideration.



Old Fayetteville Road and main school entrance.

Hillsborough Road at Greensboro Street

At this intersection, there is no sidewalk along the west side of Hillsborough. This gap in the sidewalk network is a key deficit in route connectivity. Also, the geometrics attributed to the skew of the roadway's intersection creates a wide curb radius as Hillsborough Road veers to the right. Traffic speeds and behavioral characteristics at this intersection present a barrier for school-age pedestrians without substantial traffic calming infrastructure improvements. There is an opportunity to reduce the curb radius through curb

extensions and/or median refuge. It does not appear feasible to add marked crosswalk across Greensboro because of traffic and turning traffic, unless a stop-light is installed.



Hillsborough Road at Greensboro Street.

Hillsborough Road at Old Fayetteville Road

The traffic observed at this location appeared to be traveling at or above the posted speed limit of 45 mph. This may be due to the rural roadway environment preceding the intersection. This signalized intersection is equipped with a marked crosswalk on Hillsborough Road along with push button, count-down pedestrian signal heads. Also, with the pedestrian activation, a “No Turn on Red” light is engaged to make it safer.



Hillsborough Road at Old Fayetteville Road.

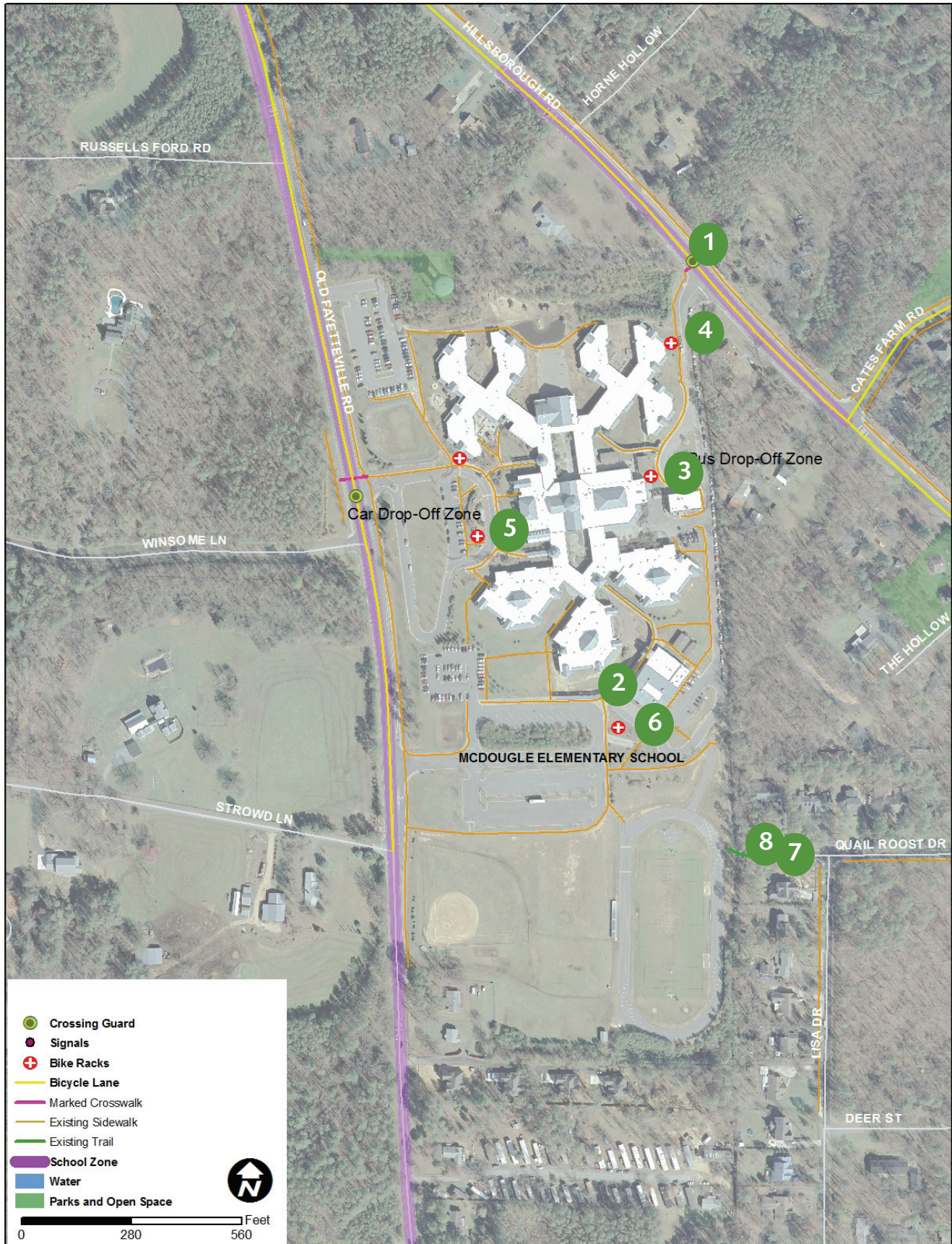
The crossing distance is wide due to the skew of the intersection and may even present a site distance obstruction for drivers approaching the intersection on Hillsborough Road. The Hillsborough Road alignment creates an acute left bend as it intersects Old Fayetteville Road. This is the roadway designers attempt to mitigate the intersection skew. However, drivers traveling northbound from the rural setting were observed approaching at high speeds and the bend in the alignment may actually impede the driver's sight distance and create an inability to see pedestrians mid-crosswalk.

Also, the southeast quadrant of the intersection is lacking sidewalk. The majority of pedestrians observed by SRTS team members were walking on the east side of Hillsborough Road to the crossing guard rather than crossing Hillsborough road to the main school entrance.

Old Fayetteville Road at Hwy 54

This creates a very distinct and impassable barrier for pedestrian traffic as currently configured. First, a sidewalk is lacking along Old Fayetteville Road and Hwy 54. NC 54 carries high-speed traffic (45 mph transitioning to 55 mph nearby). The crossing distances are very wide as well. Significant changes would be necessary to make this a pedestrian-friendly crossing.

Map 2.2 McDougale Campus Map





The crossing guard assists a family in crossing Hillsborough Road to McDougle Elementary.



Covered walkways can be found all around the McDougle campus. Here along the south end of the school buildings.



One of the bicycle racks on the east side of campus. This bicycle rack is full so additional bicycle racks may be needed.



One of the bicycle racks on the east side of campus. This sidewalk accumulates muddy runoff from the slope.



Faded marked crosswalk in the car drop-off loop in front of McDougle Elementary.



Bicycle parking on the south end of campus. This area does not receive heavy use, similar to other bicycle racks on the west side.

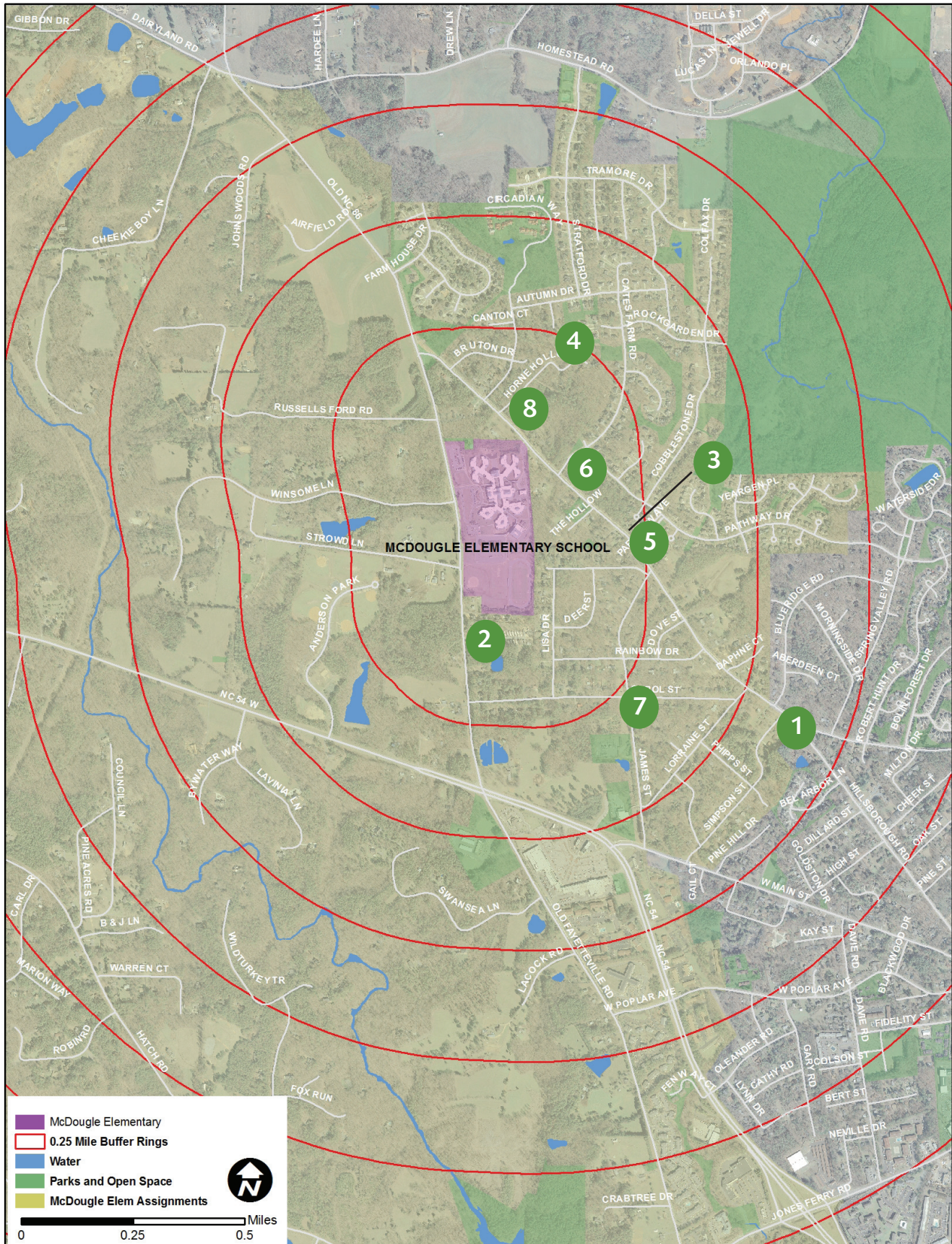


The Quail Roost path connects a large neighborhood to McDougle Elementary from the southeast.



Quail Roost path facing the school property.

Map 2.3 McDougale School Travel Map





A gap in the sidewalk system along the west side of Hillsborough Road.



Another gap in the sidewalk system, here along Old Fayetteville Road, just south of campus.



A pedestrian crossing sign on Hillsborough Road (traveling south) to warn of possible pedestrians crossing at James Street.



Unofficial portion of Horne Hollow Path. Developing this into a Town trail would shorten travel distance dramatically for many families.



Sidewalk on the east side of Hillsborough Road does not feature marked crosswalks at crossings (Above: Parkview Avenue.)



School zone sign heading north on Hillsborough Road, near campus.

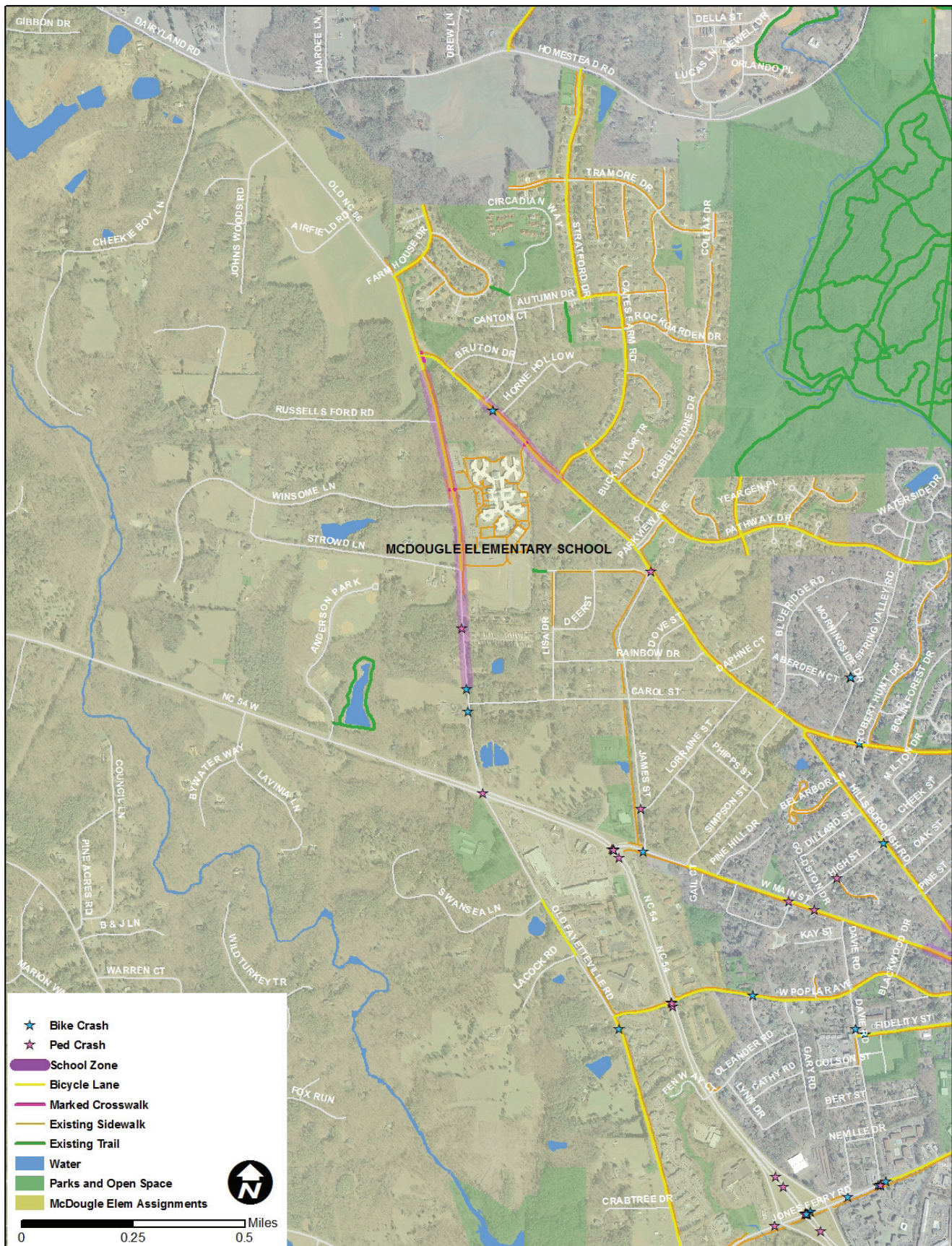


New sidewalk and crosswalk treatments along James Street, south of campus.



Many families and schoolchildren also come to McDougle Elementary from the north along Hillsborough Road.

Map 2.4 McDougle Bicycle/Pedestrian Crash Map



2.6 CARRBORO ELEMENTARY OVERVIEW

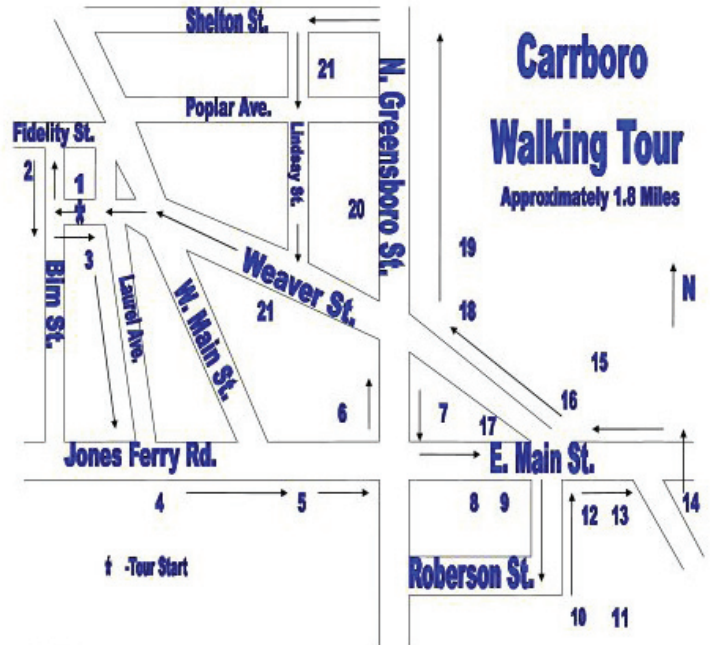
Carrboro Elementary is a walkable and bikable school for a number of reasons: 1) its existing bicycle and pedestrian facilities, 2) mindset of acceptance in Carrboro that walking and bicycling are legitimate and common forms of transportation, and 3) the desire for healthier living through exercise, community building, and lower emissions.

Carrboro Elementary is accessible only by Shelton Street and the Frances Lloyd Shetley Greenway. The school service boundary map (Map 2.1) indicates those areas of Carrboro districted for attendance at Carrboro Elementary.

2.7 TALLIES AND STUDENT COUNTS

The National Center for Safe Routes to School provides a Student Arrival and Departure Tally to help measure the mode of transportation utilized by the students and how the SRTS Program will affect vehicular trip generation for the school. This tally is taken annually and is a “yard stick” for the overall success of the program.

The following tables (2.6 & 2.7) show the results of tallies collected in the Fall of 2009 breaking down the pedestrian traffic by mode of transportation and by origin relative to school locality.



Carrboro Elementary is located very close to routes on the Carrboro Walking Tour.

Table 2.6: Travel Norms for Carrboro Elementary

Carrboro Elementary Travel Norms	
Transportation Mode	Number of Students
Driven by Parents	308
Transported by Bus	185
Walked	40 (with permission)
Bicycled	20 (with permission)

Table 2.7: Percentage of Students Walking and Bicycling by Distance

Pedestrian and Bicycle Breakout by Locality and Transportation Mode		
Distance to School	Walk	Bicycle
Less than 1/4 mile	63%	12%
Between 1/4 and 1/2 mile	14%	7%
Greater than 1 mile	0%	0%

2.8 CARRBORO ELEMENTARY PARENT SURVEYS

Likewise, the Parent Survey, provided by The National Center for Safe Routes to School, polls parents to determine the key concerns in their decision to participate in walking and bicycling programs supported by their area schools. These surveys also help identify the presence of safety-related conditions and provide basic background information for demographic correlation and analysis. Both the Parent Survey and Student Tally forms should be conducted annually to track changes and determine the success of the SRTS program.

The following information in Tables 2.8 and 2.9 was compiled from the Carrboro Elementary Parent Surveys in the Fall of 2009 and highlights parent perceptions of their children's existing walkable/ridable routes to school and the improvements necessary to elicit their participation in the SRTS program.



Carrboro Elementary School.

Table 2.8: Top Five Concerns for Parents Under Existing Conditions

Top Five Concerns of Parents	
1. Distance	
2. Traffic volume along route to school	
3. Traffic speed along route to school	
4. Safety	
5. Presence of sidewalks or pathways	

For complete results, see Appendix A.

Table 2.9: Top Five Improvements Specified as Prerequisite by Parents for Participation

Top Five Improvements	
1. Traffic volume along route to school	37.7%
2. Traffic speeds along route to school	34.9%
3. Safety of Intersections Improved	33.0%
4. Distance improved	29.2%
5. Sidewalks or pathways added/improved	27.4 %

For complete results, see Appendix A.

2.9 CARRBORO ELEMENTARY FIELD ASSESSMENT

Fieldwork included a thorough on-site assessment of existing infrastructure within the school zone and an evaluation of both traffic and behavioral patterns exhibited by roadway users during drop-off and pick-up times. The field assessment broadly analyzes school traffic patterns, characteristics of the transportation network users, and the existing infrastructure strengths and weaknesses within the school zone.

The following pages highlight the data collected pertaining to the strengths and weaknesses of the existing pedestrian environment for Carrboro Elementary School. A photographic inventory, infrastructure survey and site mapping are included.

Detailed maps depicting physical features are found in Maps 2.5-2.7.

Behavioral Components of Vehicular and Pedestrian Traffic Patterns

Pedestrian, bicycle and vehicular school traffic were all observed coming from the neighborhoods south and west of the school along Ashe and Shelton streets as well as from the neighborhoods along Main Street and Hillsborough Road. Vehicular traffic was observed from both Ashe Street and Shelton Street to access the campus. Students walking and bicycling to school were accompanied by an adult except for a few older children. Over all, there were a greater number of pedestrians than bicyclists. Additional information describing the travel norms for Carrboro Elementary is listed below:

- The overall behavior of motorists was perceived as “fair.” Drivers on campus appeared knowledgeable of the intended traffic patterns both in the traffic circle near Ashe Street as well as the drop off areas along Shelton Street. Drivers on campus exhibited appropriate courtesies toward pedestrians.
- There were two primary safety concerns observed regarding on-campus traffic: driver/parental etiquette at the drop-off and pick-up sites and the time-of-day change in directional traffic flow at the intersection of Shelton Street and Hillsborough Road.

- Often parents dropping children off would remain parked in the unloading zone for unnecessarily long periods of time. Some parents left the driver’s seat to assist children exiting the vehicle or meet their children inside the school. These actions reduced the efficiency of the carpool circle and backed up traffic. Also on numerous accounts, drivers-side doors were left open causing a hazardous obstruction in the pass-by lane.

- The intersection of Shelton Street and Hillsborough Road seemed to be a cause of frustration for drivers exiting the school under the time-of-day directional constraint of “right out only.” Drivers often disobeyed the signage and signalization of the crossing guard by turning left. It was only with the introduction of the law enforcement officer on site during the observation period that complete compliance was implemented.



Signage informing drivers that they must turn right when the crossing guard is present is a frustration for some

- Also at the intersection of Shelton Street and Hillsborough Road, there is a crosswalk across W. Main Street to a short sidewalk refuge before continuing across Hillsborough Street on the northwest side of the intersection with Shelton Street. Southbound drivers approaching the school zone on Hillsborough Street were cited in violation of speed warnings, the crossing guard’s direction and crosswalk demarcation.

- Pedestrian behavior patterns were cited as “good.” Children observed the direction of the crossing guards waiting for traffic to stop before crossing. Student cyclists accompanied parents. However, bicyclists were observed using sidewalks traveling toward Pine Street from the campus. There were also a few isolated incidents of parental infractions regarding bicycle safety with accompanying children.

Existing Infrastructure - Strengths

Since bicycle and pedestrian facilities have long been a focus of capital investment for Carrboro, there is an extensive facility base in the vicinity of Carrboro Elementary with significant bicyclist and pedestrian volumes. The existing system is substantial and the following observations were noted as existing system strengths:

- There are several well established trails connecting the nearby neighborhoods with the school grounds. These trails provide good opportunities for greenway improvements and are established as viable by the current users.
- The Frances Lloyd Shetley Greenway is a well maintained greenway with wide, paved surface and lighting leading from North Greensboro Street at the North Estes Drive intersection to the back entrance of the school. Since North Greensboro Street is a primary roadway with bicycle lanes and pedestrian treatments connected well into the surrounding neighborhoods, this greenway acts as a primary route for schoolchildren walking and bicycling to school.



The Frances Lloyd Shetley Greenway is a well maintained greenway that connects with the elementary school.

- The primary roads and collectors have existing sidewalk with “good” connectivity within the school’s one mile radius as well as significant pedestrian treatments including crosswalks, pedestrian push button signalization.

- Carrboro Elementary has a existing bicycle racks at each of the main entrances with available space for additional users.



Utilized bicycle rack on campus.

Existing Infrastructure - Deficiencies

Despite the strengths of the existing system, there are existing deficiencies in the infrastructure that impede user participation in the SRTS program. On-site survey of the existing infrastructure annotated the following weaknesses, barriers, safety hazards and concerns as follows:

- There are significant gaps in sidewalk connectivity through target neighborhoods and along the key pedestrian and bicycling routes to the school campus. Table 2.10 summarizes key locations where insufficient walkways or system breaks in the sidewalk continuity creates barriers to pedestrians.
- There are multiple roadways that pose safety barriers for elementary school-age pedestrians and bicyclists. Both traffic volume and travel speed on the roadway system within the school zone are significant most notably upon West Main Street, Greensboro Road and Estes Drive.

- Present roadway and intersection geometrics encourage higher speeds and present safety challenges for pedestrians and bicyclists. Wide turning radii at intersections typically increase traffic speeds. Additionally, intersection geometrics such as wide roadway cross sections create long distances for pedestrians to traverse increasing pedestrian hazards and reducing roadway efficiency due to lengthy pedestrian cycles. Specific concerns are presented in the following section, *Key Crossings*.

- None of the existing bicycle racks on the school's campus were covered.

- At select locations, curb ramps did not comply with ADA regulations. The most common non-compliance violations included, but were not limited to, incomplete curb ramps at intersection radii, incorrect positioning of the ramp within the radii and the lack of truncated domes in the ramp itself.

- Estes Drive is a two lane facility with heavy traffic during peak hours. Traffic appears to exceed the 35mph speed limit. The terrain is rolling with steep slopes on both sides of the roadway. Sight distance is limited at select locations and side street intersections. There are several neighborhoods within walkable/ridable distances from Carrboro Elementary with schoolchildren that could benefit from improvements.

- The Estes Drive apartment complex poses a challenge as there are reportedly crime issues in and around the complex. There is valid concern for the children's safety in the afternoon walking and/or bicycling through this area. There are several trails behind the neighborhood that are utilized by children.



A path behind Estes Apartments; well traveled, but strewn with trash.

- North Greensboro Street is a two lane, two way facility with heavy traffic. The speed limit is 30 mph as marked near the Greenway entrance. It has good sidewalks and bicycle lanes on both sides of the street, but excessive speed and volume remain a barrier.

- Currently there are no side walks and no pavement markings on Pine Street. Additionally, there is a substantial amount of parallel parking along the street making pedestrian and bicycle travel hazardous when mixed with the vehicular traffic of the neighborhood. Note, there is a funded project that will add sidewalks along one side of Pine Street.

- Many of the intersections within the grid around school (comprised of the Frances Lloyd Shetley Greenway, Shelton Street, E Poplar Avenue, Weaver Street/Ashe Street, Elm Street, Lindsey Street and Oak Avenue) have poor site distance due to large landscaped shrubs. The streets are also narrow -- two lanes in width and approximately 9' per lane with two directional traffic.



Students and parents walking down Shelton Street.

Key Crossings

W Main/Hillsborough/Shelton

Although, these three roads create two separate intersections, W. Main Street at Hillsborough Road and Hillsborough Road at Shelton Street, they operate as one geometric unit during peak hour drop-off and pick-up times due to their close proximity and school traffic flow. Both intersections are unsignalized and the side streets are under stop control. Hillsborough Road is under stop control at W.

Main Street and Shelton Street is under stop control at Hillsborough Road. W. Main Street's school zone warnings include flashing yellow beacons in conjunction with school zone and pedestrian crossing signs in both directions.



The complicated intersections of Shelton and Hillsborough Streets & Hillsborough and Main Streets both pose safety hazards.

W. Main Street has one crosswalk traversing the roadway just northwest of its intersection with Hillsborough Road. There is a vertical sight distance hazard from the southeast approach of W. Main Street creating a hazard for pedestrians utilizing the crosswalk. A higher visibility crosswalk at this location would help increase driver awareness. The wheel chair ramps have the correct orientation according to ADA regulation, however, they do not have the truncated domes within the ramp.



Crosswalk across Main Street.

During drop-offs and pick-ups, exiting vehicles from Shelton Street are instructed to turn right onto Hillsborough Road and left turns toward W. Main Street are prohibited. Drivers often ignore this directive. This often causes conflicting movements between vehicular traffic, crossing guards and pedestrian traffic.

Another critical issue at Hillsborough and Shelton is the absence of stop control prior to the crosswalk on Hillsborough Road. Drivers did not seem prepared to stop during the site visit even during peak school traffic hours. The introduction of high visibility crosswalks at this location may once again help increase driver awareness. Hillsborough Road is otherwise well equipped with pedestrian infrastructure with sidewalks lining the eastern side of the roadway and bicycle lanes delineated in both directions. Each of

Table 2.10: Insufficient Walkways

Key Sidewalk Gaps		
Roadway	Orientation	Gap Description
W. Main Street	North side	From James Street to Hillsborough Road
W. Main Street	South side	From W. Poplar Avenue to Fidelity Street
Hillsborough Road	South side	From Greensboro Street to W. Main Street
Greensboro Street	South side	From Quail Roost Drive to Hillsborough Road
Estes Drive	Both	From Railroad Crossing to Greensboro Street
Shelton Street	North side	From Oak Avenue to Ashe Street
Pine Street	West side	From Hillsborough Road to Greensboro Street
Oak Avenue	East side	From Greensboro Street to Weaver Street
Estes Apartment Trails	N/A	From Estes Park Apartments to Pleasant Drive
Pine Street Trail	N/A	From Pine Street to Carrboro Elementary

these three roads were utilized by pedestrian and bicycle traffic to the school.

N Greensboro Street at Shelton Street

Shelton Street intersects N. Greensboro Street under stop control. There is an extensive sidewalk network on both sides of N Greensboro Street as well as the north side of Shelton Street toward the school. The sidewalk ends prior to reaching the school grounds due to right-of-way constraints. The curb cuts and wheel chair ramps are in ADA compliant. There is a high visibility, ladder-style crosswalk on the north leg of N Greensboro Street which is also marked by regulatory pedestrian crossing sign on the north-bound approach only. No crosswalk currently exists on Shelton Street. N Greensboro Street is a two lane, two way roadway with curb and gutter as well as 4' striped bicycled lanes in both directions. Shelton Street is a two lane, two way roadway with a narrow cross section and no curb and gutters.



Intersection of Greensboro and Shelton Streets.

N Greensboro Street at Estes Drive

Estes Drive is a signalized "T" intersection with N Greensboro Street at the entrance of the Frances Lloyd Shetley Greenway. The majority of N Greensboro Street that falls within the school zone has extensive facilities provided for pedestrians including sidewalks, bicycle lanes and pedestrian, push button signalization at Estes Drive. Although the speed limit is posted at 30 MPH, the actual speed of traffic was observed to be greater. Likewise, the wide turning radii of the intersection encourage higher speeds for

vehicular traffic. This combination of higher speeds and large volumes of vehicular traffic makes N Greensboro Street a barrier for children living north and east of the roadway and Carrboro Elementary School hoping to participate in the SRTS program.

Crosswalk markings are in need of improvement at the intersection of N Greensboro Street and Estes Drive. This intersection would benefit from the application of ladder style crosswalks to increase driver awareness.

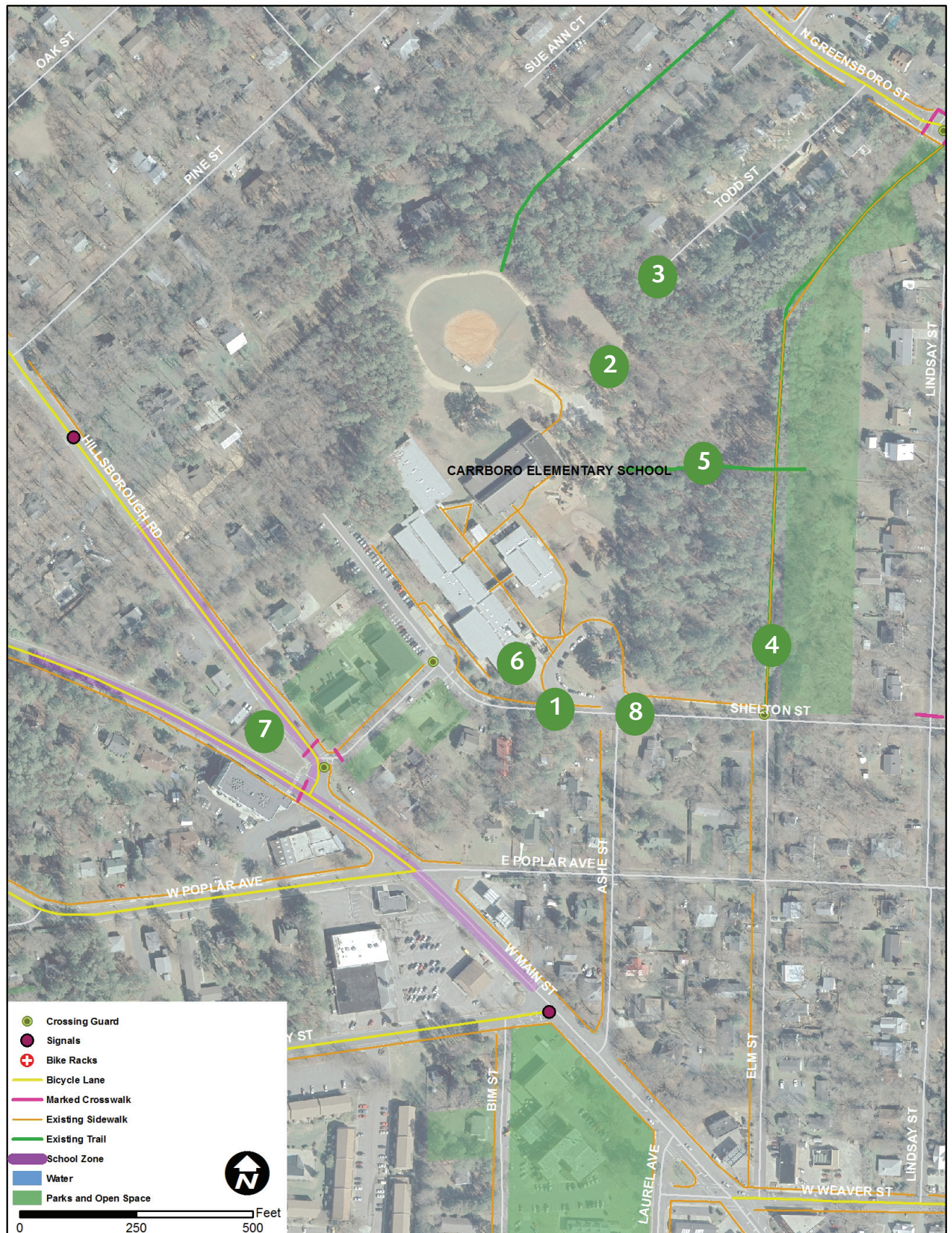


The intersection of Greensboro and Estes lacks high-visibility crosswalks.

Greensboro at Pine Street

Pine Street intersects N Greensboro Street under stop control. Although sidewalks and bicycle lanes on both sides of the roadway continue along N Greensboro Street, Pine Street has no pedestrian treatments under existing conditions. At the intersection, wheel chair ramps are not in compliance with ADA regulations neither in reference to their orientation in the curb radius nor with the inclusion of the truncated domes within the ramp itself. Furthermore, there are no existing crosswalks. Future sidewalk construction is planned Pine Street as it is a strategic route for schoolchildren in the dense neighborhoods adjacent to the school. Currently the road is narrow with no curb and gutter. GTS team members observed a frequent occurrence of on-street parking during the site visit. For pedestrians on a narrow roadway, this can prove problematic in terms of both site and path obstruction.

Map 2.5 Carrboro Elementary Campus Map





Carpool line forming in the afternoon down Shelton Street.



A father walks through a gap in the fence at the back of the school. This is a popular shortcut to walk to school.



A path leads from an apartment complex on Todd Street to the fence in the back of the school. It is a well traveled route.



The Francis Lloyd Shetley Greenway runs along the east side of school's campus and is utilized by students.



The Greenway has a paved offshoot that leads directly to the school, shown in the distance.



Students are released for the afternoon in front of the school.

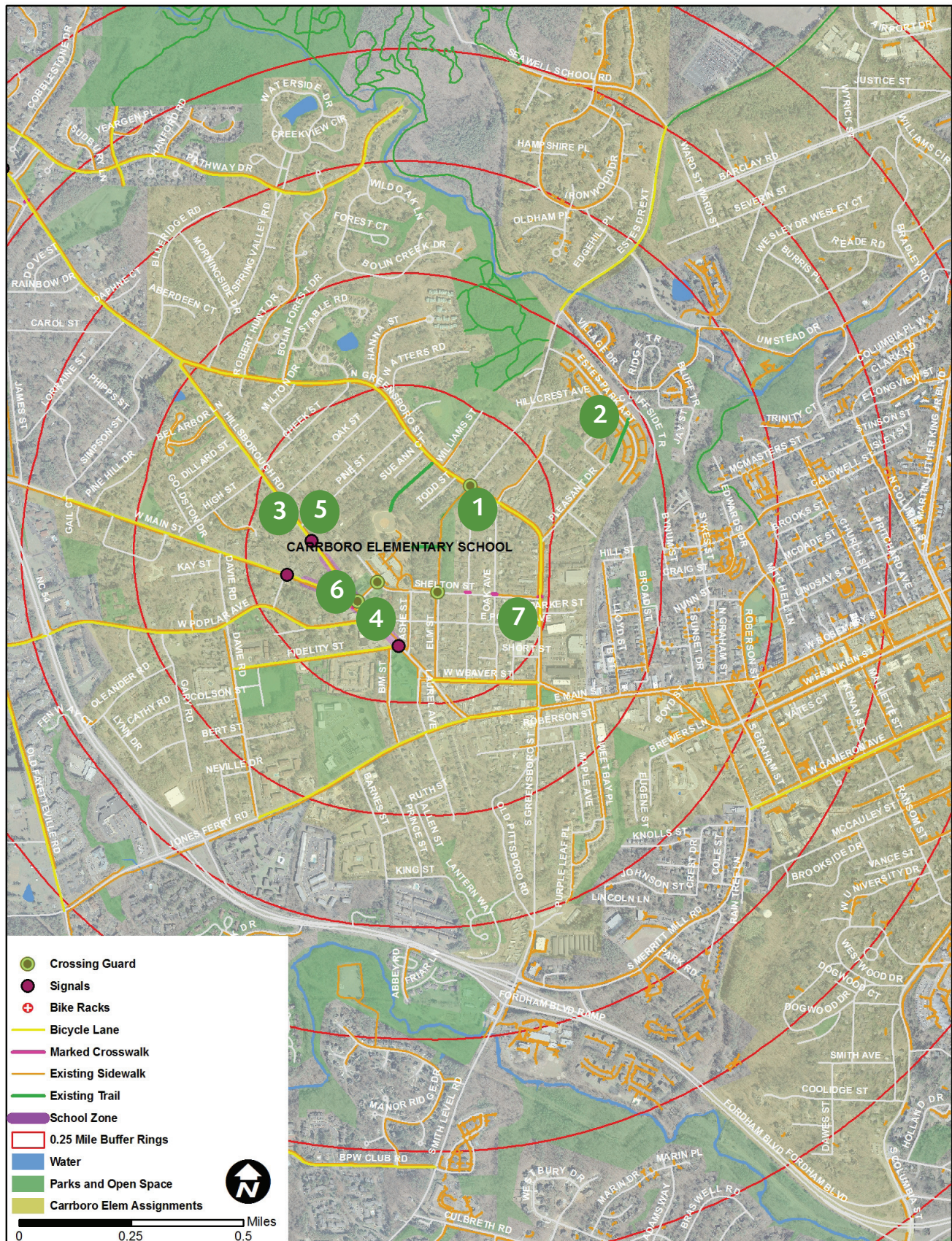


A mother crosses Hillsborough Street towards the school in the afternoon to pick up her child.



A crossing guard helps direct traffic on Shelton and Ashe Streets.

Map 2.6 Carrboro Elementary School Travel Map





The greenway intersects N Greensboro Street where Estes Drive does. Here a young cyclist attempts to turn left onto N Greensboro Street.



A well-used trail leading to the Estes Apartments.



A flashing speed limit sign on Hillsborough Street.



The intersection of Main Street and Hillsborough Street.



A family walking down Hillsborough Street.



A crosswalk across Main Street.



A one way sign on Poplar Avenue.

